clearing. Site revegetation plans will be developed for restoration of areas disturbed by PA activities.

Other activities occurring at the conclusion of construction will include site cleanup, installation of operational lighting, and installation of security fencing. Site cleanup will consist of removal of all construction equipment, materials, and debris from the site. Construction debris will be disposed at a regional facility authorized to receive such materials. The Sacramento River intakes, the IF, the consolidated pumping plant at CFF, and the HORG will be provided with security fencing to prevent unauthorized public access.

Operational lighting will be needed at the intakes, the IF, the consolidated pumping plant at CCF, at the HORG, and at the control structures associated with the Banks and Jones connections; operational lighting will also continue to be provided at the existing CVP and SWP facilities. Lighting for the proposed facilities will be designed in accordance with guidance given by DWR's WREM No. 30a, Architectural Motif, State Water Project and through coordination with local agencies through an architectural review process.

Pile Driving

Sheet pile and tubular steel pile driving will be required for intake construction, barge landing construction, embankment work at CCF, the Banks and Jones connections, and construction of the HORG. Both vibratory and impact pile driving are expected to occur at each of these locations, as structural requirements call for impact pile driving to refusal.

For all sheet pile cofferdams proposed at the Delta intakes, CCF, and HORG, it is assumed that approximately 70% of the length of each pile can be placed using vibratory pile driving, with impact driving used to finalize pile placement. Piles will be installed using vibratory methods or other non-impact driving methods for the intakes, wherever feasible, to minimize adverse effects on fish and other aquatic organisms. However, the degree to which vibratory driving can be performed effectively is unknown at this time due to as yet undetermined geologic conditions at the construction sites. The remaining pile driving would be conducted using an impact pile driver. Once constructed, if the foundation design for either the Delta intakes or HORG requires pile driving, such work would be conducted from within the cofferdam; it is still undetermined if the foundation would use piles or concrete-in-drilled-hole methods, which does not require pile driving. If driven foundation piles are included in the design, DWR will require contractors to isolate pile driving activities within dewatered cofferdams.

The barge landings would require pile driving of 24-inch tubular steel piles in the water. DWR will work with contractors to minimize pile driving, particularly impact pile driving. If dock piles for barge landings cannot be installed using vibratory methods, the construction contractor will use a bubble curtain or other attenuation device to minimize underwater noise.

Table 6.2-6 shows the approximate channel widths, timing, and duration of pile driving for each facility or structure where pile driving is proposed to occur in open water or on land within 200 ft of open water.

Table 6.2-6. Pile driving sites and durations.

Facility or Structure	Average Width of Water Body (ft)	Year of Construction	Duration of Pile Driving (days)[1]
Intake 2 Cofferdam	700	Year 8	42
Intake 2 Foundation	700	Year 9	19
Intake 3 Cofferdam	500	Year 7	42
Intake 3 Foundation	500	Year 8	14
Intake 5 Cofferdam	600	Year 5	42
Intake 5 Foundation	600	Year 6	19
Barge Landings	265 – 1,030	Year 1 - 3[2]	2
CCF Cofferdams	10,500	Year 9 - 10	85
NCCF Siphon	10,500	Year 6 - 7	36
HORG Cofferdams	150	Year 3 - 4	19
HORG Foundation	150	Year 3 - 4	4

Notes
[1] Indicates number of days required for one pile driver. Work may be completed more quickly if multiple pile driving rigs operate concurrently.
[2] Two years of pile driving per site; three years to complete pile driving at all facilities.

Contra Costa Water District Settlement Agreement Facility Construction and Operation

DWR and CCWD entered into the Agreement for Mitigation of Impacts to CCWD from Construction and Operation of the BDCP/CWF (Agreement) effective March 24, 2016. The mitigation measures required as part of the agreement include the conveyance of water to CCWD that meets specified water quality requirements, in quantities and on a schedule defined in the Agreement. The Agreement ensures that the quality of the water CCWD delivers to its customers is not impacted as a result of the BDCP/CWF. The Agreement does not increase the total amount of water that CCWD would otherwise divert, nor does it change the operational criteria presented in section 3.3 of the CWF BA, or the permitted operational criteria of the Freeport intake.

The water associated with the agreement would be conveyed to CCWD in one of two ways: (1) the primary method of conveying the water, when capacity is available, would be through the existing Freeport Regional Water Authority Intake (Freeport Intake) and the existing interconnection between East Bay Municipal Utility District's Mokelumne Aqueduct and CCWD's Los Vaqueros Pipeline, and (2) the secondary method of conveying the water, triggered under certain conditions, would be through a new Interconnection Facility between the CWF water conveyance facilities and existing CCWD facilities. Two different options for the new Interconnection Facility are being considered: either on Victoria Island between the water conveyance facilities and the existing CCWD Middle River pipeline; or at CCF between the CCF and the CCWD Los Vaqueros pipeline. No new facilities are required for the East Bay Municipal

Utility District/Freeport Intake conveyance method.

The Interconnection Facility on Victoria Island would consist of the following components: (1) a direct connection to the water conveyance facility, pumping station and appurtenant facilities (Victoria Island Interconnection Pump Station) with capacity to convey water at a normal operating capacity of up to 250 cfs, and with sufficient pressure for the water to reach CCWD's existing Transfer Pump Station while the Old River Pipeline is operating at a total flow rate of up to 320 cfs, (2) a pipeline and appurtenant facilities with a normal operating capacity of up to 250 cfs to convey water from the Interconnection Pump Station on Victoria Island to CCWD's existing Middle River Pipeline (Victoria Island Interconnection Pipeline), (3) a valve between the Interconnection Pipeline and CCWD's Middle River Pipeline (Victoria Island Interconnection Valve), and (4) all instrumentation and communication equipment needed for CCWD to remotely monitor all Interconnection Facility.

The Interconnection Facility from CCF would consist of the following components: (1) a direct connection to the CCF, pumping station and appurtenant facilities (Clifton Court Interconnection Pump Station) with capacity to convey water to CCWD's Old River Pipeline at a normal operating capacity of up to 250 cfs, and with sufficient pressure for the water to reach CCWD's existing Transfer Pump Station while the Old River Pipeline is operating at a total flow rate of up to 320 cfs, (2) a pipeline and appurtenant facilities with a normal operating capacity of up to 250 cfs to convey water from the Interconnection Pump Station at CCF to CCWD's existing Transfer Pump Station (Clifton Court Interconnection Pipeline), (3) a valve between the Interconnection Pump Stations and the Interconnection Pipeline (Clifton Court Interconnection Valve), and (4) all instrumentation and communication equipment needed for CCWD to remotely monitor the Interconnection Facility.

The Agreement does not increase the total amount of water that CCWD would otherwise divert, nor does it change the operational criteria presented in section 3.3 of the BA, or the permitted operational criteria of the Freeport intake. Under the Agreement, CCWD would take the same quantity of water that it would take absent the agreement, but the location and timing of diversions would change. Annual average diversions of Agreement water would be on the order of 30 TAF, far smaller than the total diversions through the new water conveyance facility, and the maximum rate of diversion of the Agreement water would be 250 cfs, far smaller than the diversion capacity of the new conveyance facility.

Conservation Measures

This section is intended to articulate the general construction and species-specific AMMs during construction. DWR will ground-truth impact areas prior to initiating proposed actions to determine the extent of suitable habitat present. After work is complete, DWR will field-verify the impacts that have actually occurred with implementation of AMMs. DWR will track predicted and actual impacts at each project site and provide that information in annual compliance reporting (outlined in Chapter 3, Section 3.7.4.2 of the CWF BA).

General Avoidance and Minimization Measures

CWF BA Appendix 3.4 describes the general AMMs to reduce or avoid adverse effects to listed species that may result from the PA. Table 6.2-7 briefly summarizes the measures below. Refer to CWF BA Appendix 3.F for detailed descriptions.

Table 6.2-7. Summary of the general Avoidance and Minimization Measures.

Number	Title	Summary
AMM1	Worker Awareness Training	Includes procedures and training requirements to educate construction personnel on the applicable environmental rules and regulations, the types of sensitive resources in the project area, and the measures required to avoid and minimize effects on these resources. All attendees will sign an attendance sheet along with their printed name, company or agency, email address, and telephone number. The original sign-in sheet will be sent to the Service within 7 calendar days of the completion of the training.
AMM2	Construction Best Management Practices and Monitoring	Standard practices and measures that will be implemented prior to, during, and after construction to avoid or minimize effects of construction activities on sensitive resources (*e.g.*, species, habitat), and monitoring protocols for verifying the protection provided by the implemented measures.
AMM3	Stormwater Pollution Prevention Plan	Includes measures that will be implemented to minimize pollutants in stormwater discharges during and after construction, and that will be incorporated into a stormwater pollution prevention plan to prevent water quality degradation related to project area runoff to receiving waters.
AMM4	Erosion and Sediment Control Plan	Includes measures that will be implemented for ground-disturbing activities to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas affected by construction activities, and that will be incorporated into plans developed and implemented as part of the NPDES permitting process for covered activities.
AMM5	Spill Prevention, Containment, and Countermeasure Plan	Includes measures to prevent and respond to spills of hazardous material that could affect navigable waters, as well as emergency notification procedures.
AMM6	Disposal and Reuse of Spoils, Reusable Tunnel Material, and Dredged Material	Includes measures for handling, storage, and disposal of excavation or dredge spoils and reusable tunnel material, including procedures for the chemical characterization of this material or the decant water to comply with permit requirements, and reducing potential effects on aquatic habitat, as well as specific measures to avoid and minimize effects on species in the areas where reusable tunnel material would be used or disposed.
AMM7	Barge Operations Plan	Includes measures to avoid or minimize effects on aquatic species and habitat related to barge operations by establishing specific protocols for the operation of all project-related vessels at the construction and/or barge landing sites. Also includes monitoring protocols to verify

		compliance with the plan and procedures for contingency plans.
AMM8	Fish Rescue and Salvage Plan	Includes measures that detail procedures for fish rescue and salvage to avoid and minimize the number of Chinook salmon, steelhead, green sturgeon, and other listed species of fish stranded during construction activities, especially during the placement and removal of cofferdams at the intake construction sites.
AMM9	Underwater Sound Control and Abatement Plan	Includes measures to minimize the effects of underwater construction noise on fish, particularly from impact pile driving activities. Potential effects of pile driving will be minimized by restricting work to the least sensitive period of the year and by controlling or abating underwater noise generated during pile driving.[16]
AMM10	Methylmercury Management	Design and construct wetland mitigation sites to minimize ecological risks of methylmercury production.
AMM11	Design Standards and Building Codes	Ensure that the standards, guidelines, and codes, which establish minimum design criteria and construction requirements for project facilities, will be followed. Follow any other standards, guidelines, and code requirements that are promulgated during the detailed design and construction phases and during operation of the conveyance facilities.
AMM12	Transmission Line Design and Alignment Guidelines	Design the alignment of proposed transmission lines to minimize impacts on sensitive terrestrial and aquatic habitats when siting poles and towers. Restore disturbed areas to preconstruction conditions. In agricultural areas, implement additional BMPs. Site transmission lines to avoid greater sandhill crane roost sites or, for temporary roost sites, relocate roost sites prior to construction if needed. Site transmission lines to minimize bird strike risk.
AMM13	Noise Abatement	Develop and implement a plan to avoid or reduce the potential in-air noise impacts related to construction, maintenance, and operations.
AMM14	Hazardous Material Management	Develop and implement site-specific plans that will provide detailed information on the types of hazardous materials used or stored at all sites associated with the water conveyance facilities and required emergency-response procedures in case of a spill. Before construction activities begin, establish a specific protocol for the proper handling and disposal

[16] Proposed in-water work windows vary within the Delta: June 1 through October 31 at the NDD, July 1 through November 30 at the CCF, and August 1 through November 30 at the HORG and October 31 at the barge landings. Specific in-water work windows for pile driving are below. NDD work window for pile installation using impact hammers: June 15 through September 15, with ability to extend based on success of bubble curtain and robust real-time monitoring for fish presence. Mobilization and demobilization are not included within the work window. Impact pile installation could continue between June 1 through June 15 and September 16 through October 31 in the dewatered cofferdam outside the above shortened work window with in-channel acoustic monitoring required to verify that generated sound thresholds do not exceed the behavioral criteria thresholds. Except impact pile driving, all other work including drilled shaft (also known as cast-in-drilled hole piles) construction could continue in the dewatered cofferdam outside the above referenced work windows. Any extension/reduction of work windows would focus on half-month increments. Impact pile driving window at barge landing sites: July 1 through August 3. Pile driving window at CCF: July 1 through October 31; however, mobilization and demobilization could continue to occur outside this window.

		of hazardous materials.
AMM15	Construction Site Security	Provide all security personnel with environmental training similar to that of onsite construction workers, so that they understand the environmental conditions and issues associated with the various areas for which they are responsible at a given time.
AMM16	Fugitive Dust Control	Implement basic and enhanced control measures at all construction and staging areas to reduce construction-related fugitive dust and ensure the project commitments are appropriately implemented before and during construction, and that proper documentation procedures are followed.
AMM17	Notification of Activities in Waterways	Before in-water construction or maintenance activities begin, notify appropriate agency representatives when these activities could affect water quality or aquatic species.

Delta Smelt

DWR proposes to implement varying in-water work windows for components of the PA. Table 6.2-8 provides a breakdown of the proposed timing for in-water work for the various preconstruction and construction phases.

Table 6.2-8. Proposed timing for in-water work during the preconstruction and construction phases.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CWF Conveyance System Components												
Geotechnical Explorations												
Barge Landings												
North Delta Diversions*												
Tunneled Conveyance	No proposed in-water work											
Intermediate Forebay	No proposed in-water work											
Clifton Court Forebay												
Connections to the Jones Pumping Plant												
Power Supply and Grid Connections	No proposed in-water work											
Head of Old River Gate												
Temporary Access and Work Areas	No proposed in-water work											

* Impact pile driving will be restricted to June 15 to September 15, with the ability to extend (up to October 31) based on success of bubble curtain and robust real-time monitoring for fish presence.

Riparian Brush Rabbit

1. DWR will implement the following measures to avoid and minimize noise and lighting related effects on riparian brush rabbit:
   a. Establish a 1,200-ft no disturbance buffer between any project activities and suitable habitat.
   b. Establish a 1,400-ft buffer between any lighting and pile driving and suitable habitat.
   c. Screen all lights and direct them down toward work activities away from potential occupied habitat. A Service-approved biologist will ensure that lights are properly directed at all times.
   d. Operate portable lights at the lowest allowable wattage and height, while in accordance with the National Cooperative Highway Research Program's *Report 498: Illumination Guidelines for Nighttime Highway Work.*
   e. Limit construction during nighttime hours (10:00 p.m. to 7:00 a.m.) such that construction noise levels do not exceed 50 dBA (A-weighted decibel) L_{max} at the nearest residential land uses.
   f. Limit pile driving to daytime hours (7:00 a.m. to 6:00 p.m.).

2. Geotechnical exploration for the PA will not occur in or near riparian brush rabbit suitable riparian habitat.

3. Power supply and grid connections for the PA will not occur within or near riparian brush rabbit suitable riparian habitat.

4. Restoration activities for the PA will not occur within riparian brush rabbit suitable riparian habitat, or within 100 ft of such habitat.

San Joaquin Kit Fox

Conservation Measures for Geotechnical Explorations

1. Geotechnical work in and within 200 ft of San Joaquin kit fox habitat will be limited to daytime hours.

2. Vehicles will access the work site following the shortest possible route from the levee road. All site access and staging shall limit disturbance to the riverbank or levee as much as possible and avoid sensitive habitats. When possible, existing ingress and egress points shall be used. The Service-approved biologist for San Joaquin kit fox will survey the sites for San Joaquin kit fox no less than 14 days and no more than 30 days prior to beginning of geotechnical exploration activities.

3. Project activities will not take place at night when San Joaquin kit foxes are most active.

4. Off-road traffic outside of designated project areas will be prohibited.

5. A Service-approved biologist will be stationed near the work areas to assist the construction crew with environmental issues as necessary. If San Joaquin kit foxes are encountered by a Service-approved biological monitor during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the species will not be harmed.

6. To prevent inadvertent entrapment of San Joaquin kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2 ft (0.6 m) deep will be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals.

7. All construction pipes, culverts, or similar structures with a diameter of 4 inches (10 cm) or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for San Joaquin kit foxes before the pipe is used or moved in any way. If a San Joaquin kit fox is discovered inside a pipe, construction activities will be halted and that section of pipe will not be moved until the Service-approved biologist monitoring the project construction site has contacted the Service. Once the Service has given the construction monitor instructions on how to proceed or the San Joaquin kit fox has escaped on its own volition, the pipe may be moved.

8. No firearms will be allowed at the worksite except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials.

9. Noise will be minimized to the extent possible at the work site to avoid disturbing San Joaquin kit foxes.

10. To prevent harassment, mortality of San Joaquin kit foxes or damage of dens by dogs or cats, no pets are permitted on project sites.

11. Rodenticides and herbicides will not be used during geotechnical exploration.

12. If a San Joaquin kit fox is incidentally injured or killed or entrapped, the Service-approved biological monitor shall immediately report the incident to the Service. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information.

Conservation Measures for Construction Activities

13. Within 14 to 30 days prior to ground disturbance related to PA activities, a Service-approved biologist with experience surveying for and observing the species will conduct preconstruction surveys in those areas identified as having suitable habitat per the habitat model described in Section 4.A.6.6, *Suitable Habitat Definition*, of the CWF BA or per the recommendation of the Service-approved biologist. The Service-approved biologist will survey the worksite footprint and the area within 200 ft beyond the footprint to

identify known or potential San Joaquin kit fox dens. Adjacent parcels under different land ownership will not be surveyed unless access is granted within the 200-ft radius of the construction activity. The Service-approved biologists will conduct these searches by systematically walking 30- to 100-ft-wide transects throughout the survey area; transect width will be adjusted based on vegetation height and topography (Service 1999). The Service-approved biologist will conduct walking transects such that 100% visual coverage of the worksite footprint is achieved. Dens will be classified in one of the following four den status categories outlined in the *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance*[17]. Written results of the surveys will be submitted to Service within five calendar days of the completion of surveys and prior to the beginning of ground disturbance and/or construction activities in San Joaquin kit fox modeled habitat. Also, the Service-approved biologist will flag all potential small mammal burrows within 50 ft of the worksite to alert biological and work crews of their presence.

a. Potential den - Any subterranean hole within the species' range that has entrances of appropriate dimensions for which available evidence is sufficient to conclude that it is being used or has been used by a San Joaquin kit fox. Potential dens comprise any suitable subterranean hole or any den or burrow of another species (*e.g.*, coyote, badger, red fox, or ground squirrel) that otherwise has appropriate characteristics for San Joaquin kit fox use. If a potential den is found, the Service-approved biologist will establish a 50-ft buffer using flagging.

b. Known den - Any existing natural den or artificial structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records; past or current radio telemetry or spotlighting data; San Joaquin kit fox sign such as tracks, scat, and/or prey remains; or other reasonable proof that a given den is being or has been used by a San Joaquin kit fox. If there is a known den in the action area, the Service-approved biologist will establish a 100-ft buffer using fencing.

c. Natal or pupping den - Any den used by San Joaquin kit foxes to whelp and/or rear their pups. Natal/ pupping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more San Joaquin kit fox tracks, scat, and prey remains near the den and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which San Joaquin kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is difficult to distinguish between the two; therefore, for

[17] The guidelines can be accessed at: https://www.fws.gov/sacramento/es/survey-protocols-guidelines/Documents/kitfox_standard_rec_2011.pdf

purposes of this definition, either term applies. If a natal den is discovered, a buffer of at least 200 ft will be established using fencing.

d. Atypical den - Any artificial structure that has been or is being occupied by a San Joaquin kit fox. Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings. If an atypical den is discovered, the Service-approved biologist will establish a 50-ft buffer using flagging.

14. If an atypical, natal, known or potential San Joaquin kit fox den is discovered at the worksite, the den will be monitored for three days by a Service-approved biologist using a tracking medium or an infrared beam camera to determine if the den is currently being used.

15. Unoccupied potential, known, or atypical dens will be destroyed immediately to prevent subsequent use. The den will be fully excavated by hand, filled with dirt, and compacted to ensure that San Joaquin kit foxes cannot re-enter or use the den during the construction period.

16. If an active natal or pupping den is found, the Service will be notified immediately. The den will not be destroyed until the pups and adults have vacated and then only after further coordination with Service. All known dens will have at least a 100-ft buffer established using fencing.

17. If San Joaquin kit fox activity is observed at the potential, known, or atypical den during the preconstruction surveys, den use will be actively discouraged, as described below, and monitoring will continue for an additional five consecutive days from the time of the first observation to allow any resident animals to move to another den. For dens other than natal or pupping dens, use of the den can be discouraged by partially plugging the entrance with soil such that any resident animal can easily escape. Once the den is determined to be unoccupied, it may be excavated under the direction of the Service-approved biologist. Alternatively, if the animal is still present after five or more consecutive days of plugging and monitoring, the den may have to be excavated by hand when, in the judgment of a Service-approved biologist, it is temporarily vacant (*i.e.*, during the animal's normal foraging activities). If at any point during excavation a San Joaquin kit fox is discovered inside the den, the excavation activity will cease immediately and monitoring of the den, as described above, will be resumed. Collapsing of the den may be completed when, in the judgment of the Service-approved biologist, the animal has escaped from the partially destroyed den.

18. Construction and operational requirements from *Standardized Recommendations for Protection of the San Joaquin Kit Fox prior to or during Ground Disturbance* or the latest guidelines will be implemented. The guidelines can be accessed at: https://www.fws.gov/sacramento/es/survey-protocols-guidelines/Documents/kitfox_standard_rec_2011.pdf

19. If potential, known, atypical, or natal or pupping dens are identified at the worksite or within a 200-ft buffer, exclusion zones around each den entrance or cluster of entrances will be demarcated. The configuration of exclusion zones will be circular, with a radius measured outward from the den entrance(s). No activities will occur within the exclusion zones. Exclusion zone radii for atypical dens and suitable dens will be at least 50 ft and will be demarcated with four to five flagged stakes. Exclusion zone radii for known dens will be at least 100 ft and will be demarcated with fencing that encircle each den or cluster of dens but do not prevent access to the den by the foxes.

20. Vehicles will observe a daytime speed limit of 20-mph throughout the worksite, where it is practical and safe to do so, except on county roads and State and Federal highways; vehicles will observe a nighttime speed limit of 10-mph throughout the worksite; this is particularly important at night when San Joaquin kit foxes are most active. Nighttime construction in or adjacent to San Joaquin kit fox habitat will be minimized to the greatest extent practicable.

21. To prevent inadvertent entrapment of kit foxes or other animals during construction, all excavated, steep-walled holes or trenches more than 2 ft deep will be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks will be installed. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the Service will be contacted.

22. San Joaquin kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at a construction site within suitable San Joaquin kit fox habitat for one or more overnight periods will be thoroughly inspected for San Joaquin kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a San Joaquin kit fox is discovered inside a pipe, that section of pipe will not be moved until the Service has been consulted. If necessary, and under the direct supervision of the Service-approved biologist, the pipe may be moved only once to remove it from the path of construction activity until the fox has escaped.

23. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in securely closed containers and removed at least once a week from a construction site in suitable kit fox habitat.

24. No firearms will be allowed at the worksite except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials

25. No pets, such as dogs or cats, will be permitted at worksites to prevent harassment, mortality of kit foxes, or loss of dens.

26. Use of rodenticides and herbicides in areas that are in modeled San Joaquin kit fox habitat will be prohibited.

27. The Service-approved biologist for San Joaquin kit fox will be the contact source for any employee or contractor who might incidentally kill or injure a San Joaquin kit fox or who finds a dead, injured, or entrapped San Joaquin kit fox.

28. An employee education program (AMM1, *Worker Awareness Training*) will be conducted for any activities that will be conducted in San Joaquin kit fox habitat. The program will consist of a brief presentation by the Service-approved biologist for San Joaquin kit fox to explain endangered species concerns to all personnel who will be working in the construction area. The program will include the following: A description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of San Joaquin kit fox at the worksite; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of measures being taken to reduce impacts on the species during construction and operations. A fact sheet conveying this information will be prepared for distribution to all worksite personnel.

29. Upon completion of construction at a worksite, all areas subject to temporary ground disturbances will be re-contoured if necessary, and revegetated to promote restoration of the area to preconstruction conditions. An area subject to "temporary" disturbance means any area that is disturbed during construction, but after construction will be revegetated. Appropriate methods and plant species used to revegetate such areas will be determined on a site-specific basis in consultation with the Service.

30. Any personnel who are responsible for incidentally killing or injuring a San Joaquin kit fox will immediately report the incident to the Service-approved biologist. The Service-approved biologist will contact the Service immediately in the case of a dead, injured, or entrapped San Joaquin kit fox. The Service contact is the Assistant Field Supervisor of Endangered Species, at Bay-Delta Fish & Wildlife Office, 650 Capitol Mall, Suite 8-300, Sacramento, CA 95814, (916) 930-5603. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information.

31. New sightings of San Joaquin kit fox will be reported to the California Natural Diversity Database (CNDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the San Joaquin kit fox was observed will also be provided to Service at the address below.

32. Following completion of CCF modifications, the area to be operated and maintained within suitable San Joaquin kit fox habitat will be fenced with chain link fencing that prevents entry of San Joaquin kit fox. The fencing will be inspected annually to ensure there are no holes or gaps in the fencing that would allow San Joaquin kit foxes to enter.

33. Prior to final design for the transmission line alignments, a Service-approved biologist will survey potential transmission line locations where suitable San Joaquin kit fox habitat is present. These surveys will be conducted as described above, except that the surveys will be conducted early enough to inform the final transmission line design but no less than 14 days and no more than 30 days prior to beginning of PA activities. Therefore, multiple surveys may be required. If any occupied dens are found, the Service will be immediately contacted and the project will be designed to avoid the occupied dens by 200 ft. After the final transmission line alignment has been determined, the construction conservation measures will be applied.

California Least Tern

1. If suitable nesting habitat for California least tern (flat, unvegetated areas near aquatic foraging habitat) is identified during planning-level surveys, at least three preconstruction surveys for this species will be conducted during the nesting season by a Service-approved biologist with experience observing the species and its nests. Projects will be designed to avoid loss of California least tern nesting colonies. No construction will take place within 200 ft of a California least tern nest during the nesting season (April 15 to August 15, or as determined through surveys).

2. Only inspection, maintenance, research, or monitoring activities may be performed during the least tern breeding season in occupied least tern nesting habitat with Service and CDFW approval under the supervision of a qualified biologist.

3. Safe havens, RTM, and transmission lines will fully avoid California least tern foraging habitat. Transmission lines may cross waterways, but must avoid disturbance of open water habitat.

Western Yellow-Billed Cuckoo

Measures for Activities with Fixed Locations

1. Prior to construction, all suitable western yellow-billed cuckoo habitat in the construction area will be surveyed, with surveys performed in accordance with any required Service survey protocols and permits applicable at the time of construction.

2. If surveys find western yellow-billed cuckoos in the area where vegetation will be removed, vegetation removal will be done when western yellow-billed cuckoos are not present.

3. If an activity is to occur within 1,200 ft of western yellow-billed cuckoo habitat (or within 2,000 ft if pile driving will occur) during the period of from June 15 through September 1, the following measures will be implemented to avoid noise effects on migrating western yellow-billed cuckoos.

4. Prior to the construction, a noise expert will create a noise contour map showing the 60 dBA noise contour specific to the type and location of construction to occur in the area

5. During the period between June 15 and September 1, a Service-approved biologist will survey any suitable migratory habitat for yellow-billed cuckoos within the 60 dBA noise contour on a daily basis during a two-week period prior to construction. While construction is occurring within this work window, the Service-approved biologist will conduct daily surveys in any suitable habitat where construction-related noise levels could exceed 60 dBA L_{eq} (1 hour). If a yellow-billed cuckoo is found, sound will be limited to 60 dBA in the habitat being used until the Service-approved biologist has confirmed that the bird has left the area.

6. Limit pile driving to daytime hours (7:00 a.m. to 7:00 p.m.).

7. Locate, store, and maintain portable and stationary equipment as far as possible from suitable western yellow-billed cuckoo habitat.

8. Employ preventive maintenance including practicable methods and devices to control, prevent, and minimize noise.

9. Route truck traffic in order to reduce construction noise impacts and traffic noise levels within 1,200 ft of suitable western yellow-billed cuckoo migratory habitat during migration periods.

10. Limit trucking activities (*e.g.,* deliveries, export of materials) to the hours of 7:00 a.m. to 10:00 p.m.

11. Screen all lights and direct them down toward work activities away from migratory habitat. A Service-approved biologist will ensure that lights are properly directed at all times.

12. Operate portable lights at the lowest allowable wattage and height, while in accordance with the National Cooperative Highway Research Program's *Report 498: Illumination Guidelines for Nighttime Highway Work.*

Measures for Activities with Fixed Locations

Geotechnical Explorations

1. During geotechnical activities, a Service-approved biologist will be onsite to avoid the loss or degradation of suitable western yellow-billed cuckoo habitat by exploration activities.

Safe Haven Work Areas

2. During the siting phase of safe haven construction, a Service-approved biologist will work with the engineers to avoid loss or degradation of suitable western yellow-billed cuckoo migratory habitat. This includes ensuring that safe haven work areas are not sited in western yellow-billed cuckoo habitat. This also includes ensuring noise from safe haven work areas does not exceed 60 dBA at nearby western yellow-billed cuckoo migratory habitat.

Power Supply and Grid Connections

3. The final transmission line alignment will be designed to minimize removal of western yellow-billed cuckoo migratory habitat by removing no more than four acres of the habitat. To minimize the chance of western yellow-billed cuckoo bird strikes at transmission lines, bird strike diverters will be installed on project and existing transmission lines in a configuration that research indicates will reduce bird strike risk by at least 60% or more. Bird strike diverters placed on new and existing lines will be periodically inspected and replaced as needed until or unless the project or existing line is removed. The most effective and appropriate diverter for minimizing strikes on the market according to best available science will be selected.

Safe Havens

4. Safe haven sites will avoid western yellow-billed cuckoo migratory habitat. All work associated with safe haven sites will be conducted during daylight hours, and will not require any lighting.

Giant Garter Snake

Ground-Truthed Habitat Assessment and Giant Garter Snake Surveys

1. When each site is available for surveys, a giant garter snake expert, approved by the Service and CDFW, will then delineate giant garter snake habitat at each project site, based on the definition of suitable habitat, including both aquatic and upland habitat.

2. Once habitat has been delineated, the giant garter snake expert may use giant garter snake surveys performed using a method approved by the Service to determine presence/absence of the species on the project site to enable further determination of mitigation requirements.

3. For sites where such surveys are performed, the surveys will conform to protocol and reporting need per a plan to be jointly developed by DWR, CDFW, and the Service to provide population and occurrence data for the species in the Delta.

4. To the greatest extent possible, identified and delineated habitat will be completely avoided.

Measures for Activities with Fixed Locations

5. Initiate construction and clear suitable habitat, between May 1 and September 30, and avoid giant garter snake habitat during periods of brumation (between October 1 and April 30). Suitability of aquatic and upland habitat characteristics will be determined by the Service-approved biologist consistent with the Service habitat description. Once a construction site has been cleared and exclusionary fencing is in place, work within the cleared area can occur between October 1 and April 30.

6. To the extent practicable, conduct all activities within paved roads, farm roads, road shoulders, and similarly disturbed and compacted areas; confine ground disturbance and habitat removal to the minimal area necessary to facilitate construction activities.

7. For construction activities, dredging, and any conveyance facility maintenance involving heavy equipment, giant garter snake aquatic and upland habitat that can be avoided will be clearly delineated on the work site, with exclusionary fencing and signage identifying these areas as sensitive. The exclusionary fencing will be installed during the active period for giant garter snake (May 1–September 30) and will consist of 3-ft-tall, non-monofilament silt fencing extending to 6 inches below ground level.

8. For activities requiring exclusionary fencing, the Service-approved biological monitor and construction supervisor will be responsible for checking the exclusionary fences around the work areas daily to ensure that they are intact and upright. Any necessary repairs will be immediately addressed. The exclusionary fencing will remain in place for the duration of construction.

9. The Service-approved biologist will also survey suitable aquatic and upland habitat in the entire work site for the presence of giant garter snakes, as well as 50 ft outside the work site exclusion fencing in suitable habitat.

10. If exclusionary fencing is found to be compromised, a survey of the exclusion fencing and the area inside the fencing will be conducted immediately preceding construction activity that occurs in delineated giant garter snake habitat or in advance of any activity that may result in take of the species. The Service-approved biologist will search along exclusionary fences, in pipes, and beneath vehicles before they are moved. Any giant garter snake found will be captured and relocated to suitable habitat a minimum of 200 ft outside of the work area in a location that is approved by the Service and CDFW prior to resumption of construction activity.

11. All construction personnel, and personnel involved in operations and maintenance in or near giant garter snake habitat, will attend worker environmental awareness. This training

will include instructions to workers on how to recognize giant garter snakes, their habitat(s), and the nature and purpose of protection measures.

12. Within 24 hours prior to construction activities, dredging, or maintenance activities requiring heavy equipment, a Service-approved biologist will survey all of the activity area not protected by exclusionary fencing where giant garter snake could be present. This survey of the work area will be repeated if a lapse in construction or dredging activity of two weeks or greater occurs during the brumation period (October 1 through April 30) or if the lapse in construction activity is more than 12 hours during active season (May 1–September 30). If a giant garter snake is encountered during surveys or construction, cease activities until appropriate corrective measures have been completed, it has been determined that the giant garter snake will not be harmed, or the giant garter snake has left the work area.

13. The Service-approved biological monitor will help guide access and construction work around wetlands, active rice fields, and other sensitive habitats capable of supporting giant garter snake, to minimize habitat disturbance and risk of injuring or killing giant garter snakes.

14. Report all observations of giant garter snakes to the Service-approved biological monitor.

15. Maintain all construction and operations and maintenance equipment to prevent leaks of fuel, lubricants, and other fluids and use extreme caution when handling and or storing chemicals (such as fuel and hydraulic fluid) near waterways, and abide by all applicable laws and regulations. Follow all applicable hazardous waste BMPs and keep appropriate materials on site to contain, manage, and clean up any spills as described in CWF BA Appendix 3.F.

16. Conduct service and refueling procedures in uplands in staging areas and at least 200 ft away from giant garter snake upland habitat and waterways when practicable. See also CWF BA Appendix 3.F.

17. During construction and operation and maintenance activities in and near giant garter snake habitat, employ erosion (non-monofilament silt fence), sediment, material stockpile, and dust control (BMPs on site). Avoid fill or runoff into wetland areas or waterways to the extent practicable.

18. Return temporary work areas to pre-existing contours and conditions upon completion of work. Where re-vegetation and soil stabilization are necessary in non-agricultural habitats, revegetate with appropriate non-invasive native plants at a density and structure similar to that of preconstruction conditions.

19. Properly contain and remove from the worksite all trash and waste items generated by construction and crew activities to prevent the encouragement of predators such as raccoons and coyotes from occupying the site.

20. No firearms will be allowed at the worksite except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials.

21. Store equipment in designated staging areas at least 200 ft away from giant garter snake aquatic habitat to the extent practicable.

22. Confine any vegetation clearing to the minimum area necessary to facilitate construction activities.

23. Limit vehicle speed to 10 miles per hour (mph) on access routes (except for public roads and highways) and within work areas that are within 200 ft of giant garter snake aquatic habitat that are not protected by exclusion fencing to avoid running over giant garter snakes.

24. Visually check for giant garter snakes under vehicles and equipment prior to moving them. Cap all materials onsite (conduits, pipe, etc.), precluding wildlife from becoming entrapped. Check any crevices or cavities in the work area where individuals may be present including stockpiles that have been left for more than 24 hours where cracks/crevices may have formed.

For activities that will occur within the giant garter snake inactive season (October 1 through April 30), and will last more than two weeks, DWR will implement the following additional avoidance and minimization measures.

25. If there are proposed activities that will occur within suitable aquatic giant garter snake habitat during the giant garter snake active season (May 1 through September 30), prior to proposed construction activities that will commence during the inactive period, and when unavoidable, all aquatic giant garter snake habitat will be dewatered for at least 14 days prior to excavating or filling the dewatered habitat. Dewatering is necessary because aquatic habitat provides prey and cover for giant garter snake; dewatering serves to remove the attractant, and increase the likelihood that giant garter snake will move to other available habitat. Any deviation from this measure will be done in coordination with, and with approval of, the Service.

26. Following dewatering of aquatic habitat, all potential impact areas that provide suitable aquatic or upland giant garter snake habitat will be surveyed for giant garter snake by the Service-approved biologist. If giant garter snakes are observed, they will be passively allowed to leave the potential impact area, or the Service will be consulted to determine the appropriate course of action for removing giant garter snake from the potential impact area.

27. Once habitat is deemed giant garter snake-free, exclusion fencing will be constructed around the construction site so no snakes may re-enter prior to or during construction.

The following avoidance and minimization measures will be applied to maintenance activities in suitable aquatic habitat, as delineated by a Service- approved biologist, and uplands within 200 ft of suitable aquatic habitat, to minimize effects on the giant garter snake.

28. Vegetation control will take place during the active period (May 1 through September 30) when snakes are able to move out of areas of activity.

29. Trapping or hunting methods will be used for rodent control, rather than poison bait. All rodent control methods will be approved by the Service. If trapping or other non-poison methods are ineffective, the Service will be consulted to determine the best course of action.

30. Movement of heavy equipment will be confined to outside 200 ft of the banks of giant garter snake aquatic habitat to minimize habitat disturbance.

31. All construction personnel, and personnel involved in operations and maintenance in or near giant garter snake habitat, will attend worker environmental awareness training as described in CWF BA Appendix 3.F. This training will include instructions to workers on how to recognize giant garter snakes, their habitat(s), and the nature and purpose of protection measures.

Measures for Activities with Flexible Locations

Geotechnical Activities

32. Geotechnical activities will avoid giant garter snake aquatic habitat.

33. Geotechnical activity in giant garter snake upland habitat will be confined to the giant garter snake's active period (May 1 through September 30).

34. Movement of heavy equipment will be confined to existing roads as much as possible, and will avoid suitable upland giant garter snake habitat.

35. Construction personnel will receive Service-approved worker environmental awareness training instructing workers to recognize giant garter snakes and their habitat.

Safe Haven Work Areas

36. Safe haven work areas will avoid giant garter snake aquatic and upland habitat.

Power Lines and Grid Connections

37. Giant garter snake avoidance and minimization measures for transmission lines will be the same as described in *Measures for Activities with Fixed Locations.* These power lines and grid connections will be designed to avoid giant garter snake aquatic habitat.

The following avoidance and minimization measures will be applied to maintenance activities in suitable aquatic habitat, as delineated by a Service-approved biologist, and uplands within 200 ft of suitable aquatic habitat, to minimize effects on the giant garter snake.

38. Vegetation control will take place during the active period (May 1 through September 30) when snakes are able to move out of areas of activity.

39. Trapping or hunting methods will be used for rodent control, rather than poison bait. All rodent control methods will be approved by the Service. If trapping or other non-poison methods are ineffective, the Service will be consulted to determine the best course of action.

40. Movement of heavy equipment will be confined to outside 200 ft of the banks of potential giant garter snake habitat to minimize habitat disturbance.

41. Construction personnel will receive Service-approved worker environmental awareness training instructing workers to recognize giant garter snakes and their habitat.

California Red-Legged Frog

1. A Service-approved biologist will conduct a field evaluation of the California red-legged frog modeled habitat to ascertain the distribution of suitable upland and aquatic habitat in the worksite vicinity. Surveys within suitable upland habitat will identify suitable aquatic features that may not have been identified during the habitat modeling.

Measures for Activities with Fixed Locations

2. If aquatic habitat cannot be avoided, aquatic habitats in potential work areas, will be surveyed for tadpoles and egg masses. If California red-legged frog tadpoles or egg masses are found, and the aquatic habitat cannot be avoided, the Service will be contacted, and if determined to be appropriate, measures will be developed to relocate tadpoles and eggs to the nearest suitable aquatic habitat, as determined by the Service-approved biologist.

3. The Service-approved biologist will conduct employee education training for employees working on earthmoving and/or construction activities. Personnel will be required to attend the presentation that will describe the California red-legged-frog avoidance, minimization, and conservation measures, legal protection of the animal, and other

related issues. All attendees will sign an attendance sheet along with their printed name, company or agency, email address, and telephone number. The original sign-in sheet will be sent to the Service within seven (7) calendar days of the completion of the training.

4. Preconstruction surveys will be implemented after the planning phase and prior to any ground-disturbing activity.

5. The Service-approved biologist and construction supervisor will be responsible for checking the exclusion fences around the work areas daily to ensure that they are intact and upright. This will be especially critical during rain events, when flowing water can easily dislodge the fencing. Any necessary repairs will be immediately addressed. The amphibian exclusion fencing will remain in place for the duration of construction.

6. If the exclusion fence is found to be compromised at any time, a survey will be conducted immediately preceding construction activity that occurs in designated California red-legged frog habitat or in advance of any activity that may result in take of the species. The Service-approved biologist will search along exclusion fences, in pipes, and beneath vehicles before they are moved. The survey will include a careful inspection of all potential hiding spots, such as along exclusion fencing, large downed woody debris, and the perimeter of ponds, wetlands, and riparian areas. Any California red-legged frogs found will be captured and relocated to suitable habitat, a minimum of 300 ft outside of the work area that has been identified in the relocation plan (described below) and approved by a Service-approved biologist prior to commencement of construction.

7. Initial ground-disturbing activities will not be conducted between November 1 and March 31 in areas identified during the planning stages as providing suitable California red-legged frog habitat, to avoid the period when they are most likely to be moving through upland areas. Once the initial ground disturbance has occurred, the area has been cleared, and exclusionary fencing is in place, work within the disturbed area can occur outside the construction window.

8. Surface-disturbing activities will be designed to minimize or eliminate effects on rodent burrows that may provide suitable cover habitat for California red-legged frog. Surface-disturbing activities will avoid areas with a high concentration of burrows to the greatest extent practicable. In addition, when a concentration of burrows is present in a worksite, the area will be staked or flagged to ensure that work crews are aware of their location and to facilitate avoidance of the area.

9. No initial clearing activities will occur during rain events, or within 24 hours following a rain event, prior to clearing a site and installing exclusionary fencing. A Service-approved biologist will check the exclusion fencing daily to ensure it is intact, and if there are any breaches in the fencing, the Service-approved biologist will survey the work area for California red-legged frogs. If the species is found, the Service-approved biologist will relocate the frog consistent with an approved relocation plan.

10. To the maximum extent practicable, nighttime construction will be minimized or avoided when working in suitable California red-legged frog habitat. Because dusk and dawn are often the times when the California red-legged frog is most actively moving and foraging, to the greatest extent practicable, earthmoving and construction activities will cease no less than 30 minutes before sunset and will not begin again prior to no less than 30 minutes after sunrise. Except when necessary for driver or pedestrian safety, artificial lighting at a worksite will be prohibited during the hours of darkness when working in suitable California red-legged frog habitat. No more than 24 hours prior to any ground disturbance that could affect potential California red-legged frog habitat, preconstruction surveys for California red-legged frog will be conducted by a Service-approved biologist. These surveys will consist of walking the worksite limits. The Service-approved biologist will investigate all potential areas that could be used by the California red-legged frog for feeding, breeding, sheltering, movement or other essential behaviors. This includes an adequate examination of mammal burrows, such as California ground squirrels or gophers. If any adults, subadults, juveniles, tadpoles, or eggs are found, the Service-approved biologist will contact the Service to determine if moving any of the individuals to a pre-approved location within the relocation plan is appropriate. If the Service approves moving animals, the Service-approved biologist will be given sufficient time to move the animals from the work site before ground disturbance is initiated. Only Service-approved biologists will capture, handle, and monitor the California red-legged frog.

11. If work must be conducted at night, all lighting will be directed away and shielded from California red-legged frog habitat outside the construction area to minimize light spillover to the greatest extent possible. If light spillover into adjacent California red-legged frog habitat occurs, a Service-approved biologist will be present during night work to survey for burrows and emerging California red-legged frogs in areas illuminated by construction lighting. If a California red-legged frog is found above-ground the Service-approved biologist has the authority to terminate the project activities until the light is directed away from the burrows, the California red-legged frog moves out of the illuminated area, or the California red-legged frog is relocated out of the illuminated area by the Service-approved biologist.

12. At least 15 days prior to any ground disturbance activities in suitable California red-legged frog habitats, DWR will prepare and submit a relocation plan for the Service's written approval. The relocation plan will contain the name(s) of the Service-approved biologist(s) to relocate California red-legged frogs, the method of relocation (if different than described), a map and description of the proposed release site(s) within 300 ft of the work area or at a distance otherwise agreed to by the Service, and written permission from the landowner to use their land as a relocation site.

13. Aquatic habitats within the areas that will be permanently affected by the PA will be surveyed for California red-legged frog adults and metamorphs. Any California red-legged frog adults or metamorphs that are found will be captured and held for a minimum

amount of time necessary to relocate the animal(s) to suitable habitat a minimum of 300 ft outside of the work area. Prior to and after handling frogs, the Service-approved biologist will observe the appropriate decontamination procedures to ensure against spread of chytrid fungus or other pathogens.

14. If construction activities will occur in streams or ditches, temporary aquatic barriers such as hardware cloth will be installed both up and downstream of the stream crossing, and animals will be relocated and excluded from the work area. The Service-approved biologists will establish an adequate buffer on both sides of creeks and ditches and around potential aquatic habitat and will restrict entry during the construction period.

15. The Service-approved biologist(s) will kill any aquatic exotic wildlife species, such as bullfrogs and crayfish, found on the worksite, to the greatest extent practicable.

16. Each encounter with the California red-legged frog will be treated on a case-by-case basis in coordination with the Service, but the procedure will follow the pre-approved Relocation Plan and will be conducted as follows: (1) the animal will not be disturbed if it is not in danger, or (2) the animal will be moved to a secure location if it is in any danger. These procedures are further described below:

    a. When a California red-legged frog is encountered, all activities that have the potential to result in the harassment, injury, or death of an individual will cease immediately and the Onsite Project Manager and Service-approved biologist will be notified. The Service-approved biologist will then assess the situation and select a course of action to avoid or minimize adverse effects to the animal. To the maximum extent possible, contact with the frog will be avoided to allow it to move out of the potentially hazardous situation to a secure location on its own volition. This procedure applies to situations where a California red-legged frog is encountered while it is moving to another location. It does not apply to animals that are uncovered or otherwise exposed or in areas where there is not sufficient adjacent habitat to support the species should the individual move away from the hazardous location.

    b. California red-legged frogs that are at risk of being injured or killed will be relocated and released by the Service-approved biologist outside the construction area, but within the same riparian area or watershed. If such relocation is not feasible (*e.g.*, there are too many individuals observed per day), the Service-approved biologist will relocate the animals to a location previously approved by the Service. Prior to the initial ground disturbance DWR will obtain approval of the relocation plan from the Service in the event that a California red-legged frog is encountered and needs to be moved away from the worksite. Under no circumstances will a California red-legged frog be released on a site unless the written permission of the landowner has been obtained.

c. The Service-approved biologist will limit the duration of the handling and captivity of the California red-legged frog to the minimum amount of time necessary to complete the task. If the animal must be held in captivity, it will be kept in a cool, dark, moist, aerated environment, such as a clean and disinfected bucket or plastic container with a damp sponge and a cover which air can freely pass through. The container used for holding or transporting the individual will not contain any standing water.

d. The Service will be immediately notified once the California red-legged frog and the site are secure. The Service contact is the Assistant Field Supervisor of Endangered Species, at Bay-Delta Fish & Wildlife Office, 650 Capitol Mall, Suite 8-300, Sacramento, CA 95814, (916) 930-5603.

17. For onsite storage of pipes, conduits and other materials that could provide shelter for California red-legged frogs, an open-top trailer will be used to elevate the materials above ground. This is intended to reduce the potential for animals to climb into the conduits and other materials.

18. Plastic monofilament netting (erosion control matting), loosely woven netting, or similar material in any form will not be used at the worksite because California red-legged frogs can become entangled and trapped in such materials. Any such material found on site will be immediately removed by the Service-approved biologist or construction personnel. Materials utilizing fixed weaves (strands cannot move), polypropylene, polymer or other synthetic materials will not be used.

19. Dust control measures will be implemented during construction, or when necessary in the opinion of the Service-approved biologist, Service, or their authorized agent. These measures will consist of regular truck watering of construction access areas and disturbed soil areas with water or organic soil stabilizers to minimize airborne dust and soil particles generated from graded areas. Regular truck watering will be a requirement of the construction contract. Guidelines for truck watering will be established to avoid any excessive runoff that may flow into contiguous or adjacent areas containing potential habitat for the California red-legged frog.

20. Trenches or pits 1 ft or deeper that are going to be left unfilled for more than 48 hours will be securely covered with boards or other material to prevent California red-legged frogs from falling into them. If this is not possible, wooden ramps or other structures of suitable surface that provide adequate footing for the California red-legged frog will be placed in the trench or pit to allow for their unaided escape. Auger holes or fence post holes that are greater than 0.10 inch in diameter will be immediately filled or securely covered so they do not become pitfall traps for the California red-legged frog. The Service-approved biologist will inspect the trenches, pits, or holes prior to their being filled to ensure there are no California red-legged frogs in them. The trench, pit, or hole also will be examined by the Service-approved biologist each workday morning at least

one hour prior to initiation of work and in the late afternoon no more than one hour after work has ceased to ascertain whether any individuals have become trapped. If the escape ramps fail to allow the animal to escape, the Service-approved biologist will remove and transport it to a safe location, or contact the Service for guidance.

21. To minimize harassment, injury, death, and harm in the form of temporary habitat disturbances, all vehicle traffic related to the PA will be restricted to established roads, construction areas, equipment staging, and storage, parking, and stockpile areas. These areas will be included in preconstruction surveys and, to the maximum extent possible, established in locations disturbed by previous activities to prevent further adverse effects.

22. All vehicles will observe a 20-mile per hour speed limit within construction areas where it is safe and feasible to do so, except on County roads, and State and Federal highways. Off-road traffic outside of designated and fenced work areas will be prohibited.

23. If a work site is to be temporarily dewatered by pumping, the pump intakes shall be completely screened with wire mesh not larger than five millimeters to prevent California red-legged frogs from entering the pump system. Water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to streamflow shall be removed in a manner that would allow flow to resume with the least disturbance (scour) to the substrate.

24. Uneaten human food and trash attracts crows, ravens, coyotes, and other predators of the California red-legged frog. A litter control program will be instituted at each worksite. All workers will ensure their food scraps, paper wrappers, food containers, cans, bottles, and other trash are deposited in covered or closed trash containers. The trash containers will be removed from the worksite at the end of each working day.

25. All grindings and asphaltic-concrete waste may be temporally stored within previously disturbed areas absent of habitat and at a minimum of 150 ft from any culvert, pond, creek, stream crossing, or other waterbody. On or before the completion of work at the site, the waste will be transported to an approved disposal site.

26. Loss of soil from runoff or erosion will be prevented with straw bales, straw wattles, or similar means provided they do not entangle, or block escape or dispersal routes of the California red-legged frog.

27. Insecticides or herbicides will not be applied at the worksite during construction or long-term operational maintenance where there is the potential for these chemical agents to enter creeks, streams, waterbodies, or uplands that contain potential habitat for the California red-legged frog.

28. No pets will be permitted at the worksite, to avoid and minimize the potential for harassment, injury, and death of the California red-legged frog. No firearms will be allowed at the worksite except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials to avoid and minimize the potential for harassment, injury, and death of the California red-legged frog.

Measures for Activities with Flexible Locations

Geotechnical Exploration

29. Geotechnical exploration will be sited outside of California red-legged aquatic habitat.

30. To the extent practicable, all activities will avoid impacts to California red-legged frog suitable habitat that possesses cracks or burrows that could be occupied by California red-legged frogs.

31. Preconstruction surveys will be conducted by a Service-approved biologist. A Service-approved biological monitor will be present during all drilling activities in California red-legged frog upland habitat to ensure there are no significant impacts to California red-legged frog.

32. Work will be done outside the wet season and measures, such as having vehicles follow shortest possible routes from levee road to the drill or CPT sites, will be taken to minimize the overall project footprint.

Power Lines and Grid Connections

33. The final transmission line alignments will be designed to avoid California red-legged frog aquatic habitat, and to minimize effects on upland habitat. The transmission lines will be sited at least 300 ft from occupied California red-legged frog aquatic habitat as determined through protocol-level surveys of any suitable aquatic habitat in the potential transmission line alignment. Occupancy may be assumed, in order to forego the need for protocol-level surveys. After the final transmission line alignment has been determined, the AMMs described above will be followed.

California Tiger Salamander

1. A Service-approved biologist familiar with the species and its habitat will conduct a field evaluation of suitable upland or aquatic habitat for California tiger salamander for all activities in the PA that occur within modeled habitat, or within areas of suitable habitat located by a Service-approved biologist during the field evaluation.

Measures for Activities with Fixed Locations

2. No aquatic habitat for California tiger salamander will be affected.

Site Preparation

3. The perimeter of construction sites will be fenced with amphibian exclusion fencing by no more than 14 days prior to the start of construction. The Onsite Project Manager and the Service-approved biologist (in cooperation with Service) will determine where exclusion fencing will be installed to protect California tiger salamander habitat adjacent to the defined site footprint and to minimize the potential for California tiger salamanders to enter the construction work area. The locations of exclusion fencing will be determined, in part, by the locations of suitable habitat for the species. A conceptual fencing plan will be submitted to the Service prior to the start of construction and the California tiger salamander exclusion fencing will be shown on the final construction plans. DWR will include the amphibian exclusion fence specifications including installation and maintenance criteria in the bid solicitation package special provisions. The amphibian exclusion fencing will remain in place for the duration of construction and will be regularly inspected and fully maintained. The Service-approved biological monitor and construction supervisor will be responsible for checking the exclusion fencing around the work areas daily to ensure that they are intact and upright. This will be especially critical during rain events, when flowing water can easily dislodge the fencing. Repairs to the amphibian exclusion fence will be made within 24 hours of discovery. Where construction access is necessary, gates will be installed with the exclusion fence.

4. At least 15 days prior to any ground disturbance activities, DWR will prepare and submit a Relocation Plan for Service's written approval. The Relocation Plan will contain the name(s) of the Service-approved biologist(s) to relocate California tiger salamanders, the method of relocation (if different than described), a map, and a description of the proposed release site(s) within 300 ft of the work area or at a distance otherwise agreed to by Service, and written permission from the landowner to use their land as a relocation site.

5. Preconstruction surveys will be conducted by a Service-approved biologist immediately prior to the initiation of any ground-disturbing activities or vegetation clearing in areas identified as having suitable California tiger salamander habitat. Prior to initiating surveys, water trucks will spray the work area to encourage emergence. Watering will occur at dusk, trucks will make a single pass, and the Service-approved biologist(s) will survey the watered area for one hour following the spraying. If California tiger salamanders are found, they will be relocated consistent with the Relocation Plan described above.

Initial Clearance/Ground Disturbance

6. Except for limited vegetation clearing necessary to minimize effects to nesting birds, initial suitable habitat clearance and disturbance will be confined to the dry season, generally July 15 through October 15. All initial clearing will be limited to periods of no or low rainfall (less than 0.08 inches per 24-hour period and less than 40% chance of rain). Clearing activities within California tiger salamander habitat will cease 24 hours prior to a 40% or greater forecast of rain from the closest National Weather Service (NWS) weather station. Clearing may continue 24 hours after the rain ceases, if no precipitation is in the 24-hour forecast. If clearing must continue when rain is forecast (greater than 40% chance of rain), a Service-approved biologist will survey the worksite before clearing begins each day rain is forecast. If rain exceeds 0.5 inches during a 24-hour period, clearing will cease until the NWS forecasts no further rain. Modifications to this timing may be approved by Service based on site conditions and expected risks to California tiger salamanders. Once the ground has been cleared and perimeter fencing is in place, these restrictions do not apply.

During Construction

7. The Service-approved biologist shall conduct clearance surveys at the beginning of each day and regularly throughout the workday when construction activities are occurring that may result in take of California tiger salamander. These surveys will consist of walking surveys within the worksites and investigating suitable aquatic and upland habitat including refugia habitat such as small woody debris, refuse, burrow entries, etc. All mammal burrows within the worksite limits that cannot be avoided will be hand-excavated and collapsed so that they do not attract California tiger salamanders during construction.

8. If the exclusion fence is compromised during the rainy season, when California tiger salamanders are likely to be active, a survey will be conducted immediately preceding construction activity that occurs in modeled or suitable California tiger salamander habitat, as determined by a Service-approved biologist, or in advance of any activity that may result in take of the species. The Service-approved biologist will search along exclusion fences, in pipes, and beneath vehicles each morning before they are moved. The survey will include a careful inspection of all potential hiding spots, such as along exclusion fencing, large downed woody debris, and the perimeter of ponds, wetlands, and riparian areas. Any tiger salamanders found will be captured and relocated to suitable habitat with an active rodent burrow system at a location predetermined prior to commencement of construction in the Relocation Plan.

9. To avoid entrapment of animals during construction, pipes or similar structures will be capped if stored overnight. Excavated holes and trenches will have escape ramps, and any open holes and trenches more than 6 inches deep will be closed with plywood at the end of each workday. The Service-approved biologist will inspect all holes and trenches at the

beginning of each workday and before the holes and trenches are filled. All pipes, culverts, or similar structures stored in the work area overnight will be inspected before they are subsequently moved, capped, and/or buried. If a California tiger salamander is discovered, the Onsite Project Manager and Service-approved biologist will be notified immediately, and the Service-approved biologist will move the animal to a safe nearby location (as described by the species observation and handling protocol below) and monitor it until it is determined that it is not imperiled by predators, or other dangers.

10. If verbally requested before, during, or upon completion of ground disturbance and construction activities where suitable California tiger salamander habitat is present, DWR will ensure that the Service can immediately access and inspect the worksite for compliance with the description of the PA, including its AMMs, and to evaluate effects on the California tiger salamander and its habitat. A Service-approved biologist will be onsite during all activities that may result in take of California tiger salamander. The Service-approved biologist will carry a working mobile phone whose number will be provided to Service prior to the start of construction and ground disturbance.

11. The Service-approved biologist will have the authority to stop activities at the worksite if they determine that any of the AMMs are not being fulfilled.

12. The Service-approved biologist will maintain monitoring records that include (1) the beginning and ending time of each day's monitoring effort, (2) a statement identifying the covered species encountered, including the time and location of the observation, (3) the time the specimen was identified and by whom and its condition, (4) the capture and release locations of each individual, (5) photographs and measurements (snout to vent and total length) of each individual, and (6) a description of any actions taken. The Service-approved biologist will maintain complete records in their possession while conducting monitoring activities and will immediately provide records to the Service upon request. If requested, all monitoring records will be provided to the Service within 30 days of the completion of monitoring work.

13. To the extent possible, earthmoving and construction activities will cease no less than 30 minutes before sunset and will not begin again until no less than 30 minutes after sunrise within 300 ft of California tiger salamander habitat. Except when necessary for driver or pedestrian safety, to the greatest extent practicable, artificial lighting at a worksite will be prohibited during the hours of darkness.

14. If work must be conducted at night within 300 ft of California tiger salamander habitat, all lighting will be directed away and shielded from California tiger salamander habitat outside the construction area to minimize light spillover to the greatest extent possible. If light spillover into adjacent California tiger salamander habitat occurs, a Service-approved biologist will be present during night work to survey for burrows and emerging California tiger salamanders in areas illuminated by construction lighting. If California tiger salamander is found above-ground the Service-approved biologist has the authority

to terminate the project activities until the light is directed away from the burrows, the California tiger salamander moves out of the illuminated area, or the California tiger salamander is relocated out of the illuminated area by the Service-approved biologist.

15. No rodenticides will be used during construction or long-term operational maintenance in areas that support suitable upland habitat for California tiger salamander.

16. To prevent California tiger salamander from becoming entangled, trapped, or injured by erosion control structures, erosion control measures that use plastic or synthetic monofilament netting will not be used within areas designated to have suitable California tiger salamander habitat. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include natural fibers such as jute, coconut, twine, or other similar fibers. Following site restoration, erosion control materials, such as straw wattles, will be placed in a manner that will not block movement of the California tiger salamander.

Species Observation and Handling Protocol

17. If a California tiger salamander is observed, the Service-approved biologist will implement the following species observation and handling protocol. Only Service-approved biologists will participate in activities associated with the capture, handling, and monitoring of California tiger salamanders. If a California tiger salamander is encountered in a construction area, activities within 50 ft of the individual will cease immediately and the Onsite Project Manager and Service-approved biologist will be notified. Based on the professional judgment of the Service-approved biologist, if activities at the worksite can be conducted without harming or injuring the California tiger salamander, it may be left at the location of discovery and monitored by the Service-approved biologist. All personnel on site will be notified of the finding and at no time will work occur within 50 ft of the California tiger salamander without a Service-approved biologist present. If it is determined by the Service-approved biologist that relocating the California tiger salamander is necessary, the following steps will be followed:

    a. Prior to handling and relocation, the Service-approved biologist will take precautions to prevent introduction of amphibian diseases in accordance with the Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander (Service 2003). Disinfecting equipment and clothing is especially important when Service-approved biologists are coming to the action area to handle amphibians after working in other aquatic habitats. California tiger salamanders will also be handled and assessed according to the Restraint and Handling of Live Amphibians. The Handling of Live Amphibians standard operating procedures can be accessed at:

https://www.nwhc.usgs.gov/publications/amphibian_research_procedures/handling_and_restraint.jsp

b. California tiger salamanders will be captured by hand, dipnet, or other Service-approved methodology, transported, and relocated to nearby suitable habitat outside of the work area and released as soon as practicable the same day of capture. Individuals will be relocated no greater than 300 ft outside of the work area to areas with an active rodent burrow or burrow system (unless otherwise approved by Service). Holding/transporting containers and dipnets will be thoroughly cleaned, disinfected, and rinsed with freshwater prior to use within the action area. The Service will be notified within 24 hours of all capture, handling, and relocation efforts. The Service-approved biologists will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating individuals. To avoid transferring disease or pathogens when handling the amphibians, Service-approved biologists will follow the Declining Amphibian Populations Task Force's "Code of Practice." The "Code of Practice" can be accessed on the internet at: https://www.fws.gov/ventura/docs/species/protocols/DAFTA.pdf

c. If an injured California tiger salamander is encountered and the Service--approved biologist determines the injury is minor or healing and the salamander is likely to survive, the salamander will be released immediately, consistent with the pre-approved Relocation Plan as described above. The California tiger salamander will be monitored until it is determined that it is not imperiled by predators or other dangers.

d. If the Service-approved biologist determines that the California tiger salamander has major or serious injuries because of activities at the worksite, the Service-approved biologist, or designee, will immediately take it to a Service-approved facility. If taken into captivity, the individual will not be released into the wild unless it has been kept in quarantine and the release is authorized by the Service. DWR will bear any costs associated with the care or treatment of such injured California tiger salamanders. The circumstances of the injury, the procedure followed and the final disposition of the injured animal will be documented in a written incident report. Notification to the Service of an injured or dead California tiger salamander in the action area will be made as described under the Reporting Requirements measure, and reported whether or not its condition resulted from activities related to the PA. In addition, the Service-approved biologist will follow up with the Service in writing within two calendar days of the finding. Written notification to the Service will include the following information: the species, number of animals taken or injured, sex (if known), date, time, location of the incident or of the finding of a dead or injured animal, how the individual was taken, photographs of the specific animal, the names of the persons who observe the take and/or found the animal, and any other pertinent information. Dead

specimens will be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen.

Measures for Activities with Flexible Locations

Geotechnical Explorations

18. Geotechnical exploration will be sited outside of California tiger salamander aquatic habitat.

19. To the extent practicable, all project activities within California tiger salamander suitable habitat will avoid impacts to areas that possess cracks or burrows that could be occupied by California tiger salamanders.

20. Preconstruction surveys will be conducted by a Service-approved biologist. A Service-approved biological monitor will be present during all drilling activities to ensure there are no significant impacts to California tiger salamander.

21. Work will be done during the dry season (July 15 through October 31) and measures, such as having vehicles follow shortest possible routes from levee road to the drill or CPT sites, will be taken to minimize the overall project footprint.

22. Geotechnical exploration activities will cease no less than 30 minutes before sunset and will not begin again until no less than 30 minutes after sunrise within 300 ft of California tiger salamander habitat.

Safe Havens

23. Safe havens will avoid suitable California tiger salamander habitat.

Power Supply and Grid Connections

24. The final transmission line alignments will be sited to avoid California tiger salamander aquatic habitat, and to minimize effects on upland habitat. The transmission lines will be sited at least 300 ft from occupied California tiger salamander aquatic habitat as determined through protocol-level surveys of any suitable aquatic habitat within the potential transmission line alignment. Occupancy may be assumed, in order to forego the need for protocol-level surveys. After the final transmission line alignment has been determined, the avoidance and minimization measures described in Activities with Fixed Locations, will be followed, with the following exception: Transmission line construction activities will cease no less than 30 minutes before sunset and will not begin again until no less than 30 minutes after sunrise within 300 ft of California tiger salamander habitat.

Valley Elderberry Longhorn Beetle

Measures for Activities with Fixed Locations

1. Preconstruction surveys for elderberry shrubs will be conducted within all facility footprints and all areas within 100 ft of facility footprints. The preconstruction surveys will be conducted by a Service-approved biologist familiar with the appearance of valley elderberry longhorn beetle exit holes in elderberry shrubs. Preconstruction surveys will be conducted in the calendar year prior to construction and will follow the guidance of Service's Conservation Guidelines for the Valley Elderberry Longhorn Beetle (Service 1999), hereafter referred to as the 1999 Valley Elderberry Longhorn Beetle Conservation Guidelines. The results of preconstruction surveys will be reported to the Service. Elderberry shrubs will be avoided to the greatest extent practicable. Complete avoidance (*i.e.*, no adverse effects) may be assumed when a buffer of at least 100 ft is established and maintained around elderberry plants containing stems measuring 1 inch or greater in diameter at ground level. Firebreaks may not be included in the buffer zone. The Service will be consulted before any disturbances, including construction, within the 100-ft buffer area are considered. Any damaged area within the buffer zones will be restored following the conclusion of construction in the work area.

   Elderberry shrubs that must be removed will be transplanted to Service-approved Conservation Areas (the areas where plantings will occur to offset impacts). Transplanting, avoidance measures, and associated compensation will follow the 1999 Valley Elderberry Longhorn Beetle Conservation Guidelines except where modified with site specificity as stated herein. Avoidance measures for shrubs not directly affected by construction but within 100 ft of ground-disturbing activities will follow the guidance outlined in the 1999 Valley Elderberry Longhorn Beetle Conservation Guidelines as well.

2. For shrubs not directly affected by construction but that occur between 20 ft and 100 ft from ground-disturbing activities, the following measures will be implemented.

   a. Fence and flag areas to be avoided during construction activities. In areas where encroachment on the 100-ft buffer has been approved by the Service, provide a minimum setback of at least 20 ft from the dripline of each elderberry plant.

   b. To the greatest extent practicable, construction will be limited during the valley elderberry longhorn beetle active season, March 15th through June 15th.

   c. Brief contractors on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements.

   d. Erect signs every 50 ft along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the

Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs will be clearly readable from a distance of 20 ft, and must be maintained for the duration of construction.

e. Instruct work crews about the status of the beetle and the need to protect its elderberry host plant.

f. During construction activities, no insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant will be used in the 100-ft buffer area.

g. To the greatest extent practicable, nighttime construction will be minimized or avoided between March 15th and June 15th where valley elderberry longhorn beetle is likely to be present. Because there is potential for valley elderberry valley longhorn beetles to be attracted to nighttime light and thus increase the potential for predation, activities will cease no less than 30 minutes before sunset and will not begin again prior to no less than 30 minutes after sunrise. Except when necessary for driver or pedestrian safety, to the greatest extent practicable, artificial lighting at a construction site will be prohibited during the hours of darkness where valley elderberry longhorn beetle is likely to be present.

h. Night lighting of valley elderberry longhorn beetle habitat will be minimized to the extent practicable. If night lighting is to be used, to the greatest extent possible it will be pointed toward work areas and away from riparian, other sensitive habitats, and other areas that contain elderberry shrubs.

i. Restore any damage done to the buffer area (area within 100 ft of elderberry plants) during construction. Provide erosion control and re-vegetate with appropriate native plants.

j. For those parts of the water conveyance facility that will require ongoing maintenance (*e.g.*, intake facilities, pump facilities at CCF, in rights-of-way around permanent transmission lines, around vent shafts, etc.), buffer areas must continue to be maintained for the protection of the species after construction with measures such as fencing, signs, weeding, and trash removal as appropriate.

k. A written description of how the buffer areas are to be restored and maintained for the protection of the species will be provided to the Service.

l. To prevent fugitive dust from drifting into adjacent habitat, all clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, demolition activities, or other dust generating activities will be effectively controlled for fugitive dust emissions utilizing application of water or by presoaking work areas.

3. For shrubs directly affected by construction, and within 20 ft of disturbance activities if this area is also disturbed, the following measures will be followed for transplantation.

    a. A Service-approved biologist must be onsite for the duration of the transplanting of the elderberry plants to ensure that no unauthorized take of the valley elderberry longhorn beetle occurs. If unauthorized take occurs, the monitor has the authority to stop work until corrective measures have been completed. The monitor must immediately report any unauthorized take of the beetle or its habitat to the Service and to the CDFW.

    b. Elderberry shrubs will be transplanted during their dormant season, which occurs from November, after they have lost their leaves, through the first two weeks in February. If transplantation occurs during the growing season, increased compensation ratios will apply. Compensation ratios could be up to three times the standard compensation ratios as determined in consultation with Service staff.

    c. Transplantation procedure will be as specified in the 1999 Valley Elderberry Longhorn Beetle Conservation Guidelines.

    d. Elderberry shrubs will be transplanted into the area where plantings will occur to offset impacts referred to in the 1999 Valley Elderberry Longhorn Beetle Conservation Guidelines as the Conservation Area.

    e. If a plant appears to be unlikely to survive transplantation, then transplantation is not required, but a higher compensation ratio may be applied. In this instance, the Service will be contacted to determine the appropriate action.

Measures for Activities with Flexible Locations

4. During the planning phase, for these not fully sited activities, preconstruction surveys for elderberry shrubs will be conducted in potential work areas by a Service-approved biologist familiar with the appearance of valley elderberry longhorn beetle exit holes in elderberry shrubs. Preconstruction surveys will be conducted in accordance with the protocol provided in the 1999 Valley Elderberry Longhorn Beetle Conservation Guidelines, and survey results will be reported to the Service. Elderberry shrubs will be avoided to the greatest extent practicable. Complete avoidance (*i.e.*, no adverse effects) may be assumed when a buffer of at least 100 ft is established and maintained around elderberry plants containing stems measuring 1 inch or greater in diameter at ground level. Firebreaks may not be included in the buffer zone. The Service will be consulted before any disturbances, including construction, within the 100-ft buffer area are considered. Any damaged area within the buffer zones will be restored following the conclusion of construction in work areas.

Geotechnical Activities

5. Geotechnical exploration activities for the PA will fully avoid effects on valley elderberry longhorn beetle and its habitat.

Safe Haven Work Areas

6. Workers will confine ground disturbance and habitat removal to the minimal area necessary to facilitate construction activities. In addition, AMMs for safe haven interventions will be the same as described in Activities with Fixed Locations.

Power Lines and Grid Connections

7. Based on the planning level surveys, the siting of transmission towers and poles will avoid elderberry shrubs to the extent practicable. Valley elderberry longhorn beetle avoidance and minimization measures for transmission lines will be the same as described in Activities with Fixed Locations.

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

Activities with Known Locations

1. Staging areas will be designed so that they are more than 250 ft from vernal pool fairy shrimp or vernal pool tadpole shrimp habitat. All vehicles will access the work site following the shortest possible route from the levee road. All site access and staging shall limit disturbance to the riverbank, or levee as much as possible and avoid sensitive habitats. When possible, existing ingress and egress points shall be used.

2. A vehicle inspection and fueling area will be established at least 250 ft away from any vernal pools or seasonal wetlands to reduce the potential for chemical pollution such as oil, diesel, or hydraulic fluid. An inspection and fueling plan will be developed and construction workers trained so that any contamination is minimized. An emergency spill response plan will be completed and all workers will be trained on how to respond to emergency spills of chemicals.

3. If habitat is avoided (preserved) at the site, a Service-approved biologist will inspect any construction-related activities at the activity site to ensure that no unnecessary take of listed species or loss of their habitat occurs. The Service-approved biologist will have the authority to stop all activities that may result in take or loss of habitat until appropriate corrective measures have been completed. The Service-approved biologist also will be required to immediately report any unauthorized impacts to the Service.

4. Topographic depressions that are likely to serve as seasonal vernal pools will be flagged and avoided where possible.

5. Silt fencing will be installed wherever activities occur within 250 ft of vernal pool type seasonal wetlands. To avoid additional soil disturbances caused by silt fence installation, the bottom portion of the fence will be secured by waddles rather than buried.

6. All onsite construction personnel will receive instruction regarding the presence of listed species and the importance of avoiding impacts on the species and their habitat.

7. All activities that are inconsistent with the maintenance of the suitability of remaining habitat and associated onsite watersheds that support vernal pool fairy shrimp or vernal pool tadpole shrimp habitat are prohibited. This includes, but is not limited to: (1) alteration of existing topography or any other alteration or uses for any purposes, (2) placement of any new structures on these parcels, (3) dumping, burning, and/or burying of rubbish, garbage, or any other wastes or fill materials, (4) building of any new roads or trails, (5) killing, removal, alteration, or replacement of any existing native vegetation, (6) placement of storm water drains, (7) fire protection activities not required to protect existing structures at the site, and (8) use of pesticides or other toxic chemicals.

Activities with Uncertain Locations

8. Geotechnical exploration activities, the construction and operation and maintenance of transmission lines, and restoration activities for the PA will fully avoid effects on vernal pool fairy shrimp and vernal pool tadpole shrimp and their habitat. Full avoidance requires a minimum 250-ft, no-disturbance buffer around all vernal pools and other aquatic features potentially supporting vernal pool fairy shrimp or vernal pool tadpole shrimp.

Least Bell's Vireo

1. Prior to disturbing an area potentially supporting habitat for the species, a Service-approved biologist will evaluate the area to identify suitable habitat.

Measures for Activities with Fixed Locations

2. Prior to construction, all suitable least Bell's vireo habitat in the construction area will be surveyed, with surveys performed in accordance with any required Service survey protocols and permits applicable at the time of construction.

3. If surveys find least Bell's vireos in the area where vegetation will be removed, vegetation removal will be done when the birds are not present.

4. If an activity is to occur within 1,200 ft of least Bell's vireo habitat (or within 2,000 ft if pile driving will occur) during the breeding period for least Bell's vireos, the following measures will be implemented to avoid noise effects on least Bell's vireo.

a. Prior to the construction, a noise expert will create a noise contour map showing the 60 dBA noise contour specific to the type and location of construction to occur in the area.

b. During the breeding period for least Bell's vireo, a Service-approved biologist will survey any suitable habitat for least Bell's vireo within the 60 dBA noise contour on a daily basis during a two-week period prior to construction. While construction is occurring within this work window, the Service-approved biologist will conduct daily surveys in any suitable habitat where construction-related noise levels could exceed 60 dBA (A-weighted decibel) Leq (1 hour). If a least Bell's vireo is found, sound will be limited to 60 dBA in the habitat being used until the Service-approved biologist has confirmed that the bird has left the area.

5. Limit pile driving to daytime hours (7:00 a.m. to 7:00 p.m.).

6. Locate, store, and maintain portable and stationary equipment as far as possible from suitable least Bell's vireo habitat.

7. Employ preventive maintenance including practicable methods and devices to control, prevent, and minimize noise.

8. Route truck traffic in order to reduce construction noise impacts and traffic noise levels within 1,200 ft of suitable least Bell's vireo habitat during migration periods.

9. Limit trucking activities (*e.g.*, deliveries, export of materials) to the hours of 7:00 a.m. to 10:00 p.m.

10. Screen all lights and direct them down toward work activities and away from migratory habitat. A Service-approved biologist will ensure that lights are properly directed at all times.

11. Operate portable lights at the lowest allowable wattage and height, while in accordance with the National Cooperative Highway Research Program's Report 498: Illumination Guidelines for Nighttime Highway Work (Ellis *et al.* 2003).

Measures for Activities with Flexible Locations

Geotechnical Explorations

12. During geotechnical activities, a Service-approved biologist will be onsite to avoid the loss or degradation of suitable least Bell's vireo habitat by geotechnical exploration activities.

Safe Haven Work Areas

13. During the siting phase of safe haven construction, a Service-approved biologist will work with the engineers to avoid loss or degradation of suitable least Bell's vireo habitat. This includes ensuring that safe haven work areas are not sited in least Bell's vireo habitat. This also includes ensuring noise from safe haven work areas do not exceed 60 dBA at nearby least Bell's vireo habitat.

Power Supply and Grid Connections

14. The final transmission line alignment will be designed to minimize removal of least Bell's vireo habitat by removing no more than three acres of this habitat. To minimize the chance of least Bell's vireo bird strikes at transmission lines, bird strike diverters will be installed on project and existing transmission lines in a configuration that research indicates will reduce bird strike risk by at least 60% or more. Bird strike diverters placed on new and existing lines will be periodically inspected and replaced as needed until or unless the project or existing line is removed. The most effective and appropriate diverter for minimizing strikes on the market according to best available science will be selected.

Safe Havens

15. Safe haven sites will avoid least Bell's vireo habitat. All work associated with safe haven sites will be conducted during daylight hours, and will not require any lighting.

6.3 Compensatory Mitigation – Programmatic and Standard Actions

This section summarizes the proposed mitigation. As part of compensatory mitigation for impacts to listed species from the PA, DWR has proposed the following options: (1) restoration with protection in perpetuity, (2) enhancement with protection in perpetuity, (3) purchasing credits at an approved conservation bank, (4) creating and establishing a conservation bank, and (5) protection in perpetuity without restoration or enhancement. DWR has proposed to develop and implement management plans for restoration and protection sites but has not identified specific sites. The action agencies proposed that compensatory mitigation will be constructed and protected prior to PA impacts. All mitigation ratios below reflect protected habitat: lost habitat.

The PA includes a commitment that all lands protected and restored for compensation of effects on listed species will be protected and managed in perpetuity, and DWR will ensure adequate funding for this perpetual management. DWR will dedicate an endowment fund or other Service-approved perpetual funding mechanism for this purpose, and designate the party or entity that will be responsible for long-term management of these lands. Further, the endowment or other Service-approved financial assurance will designate the party or entity that will be responsible for the long-term management of these lands and associated waterways as applicable. The Service will be provided with written documentation that funding and management of mitigation lands will be provided in perpetuity. Habitat compensation will occur prior to the impact being compensated for. The compensatory mitigation strategy is further detailed in the *BiOp Resolution Log*.

For activities under the Corps' Phase 1 permitting process, if it is determined that listed species or critical habitat are present and may be affected as a result of the compensatory mitigation, the Corps is required to reinitiate this consultation to address these effects. Effects of the compensatory mitigation associated with the Corps Phase 2 and Reclamation's actions will be addressed in subsequent consultations. Phase 2 compensatory mitigation activities will be subject to approvals by either Reclamation or the Corps, depending on the nature of the activities and authority and oversight over the activities. Therefore, subsequent consultations with either of these agencies will occur in order to assess the effects of Phase 2 compensatory mitigation. The mitigation approach for the construction of the CCWD Settlement Agreement will be consistent with mitigation approach for effects to species from other CWF construction activities.

NMFS Species

The PA includes restoration of 154.8 acres of tidal perennial habitat suitable for NMFS species and 4.3 miles of channel margin habitat to mitigate for permanent and temporary losses of migration and rearing habitat. Refer to the CWF BA for further discussion.

As a condition of approval of the ITP under Section 2081(b) of the California Fish & Game Code (2081(b) ITP), CDFW is requiring that, upon issuance of a final water right order by the SWRCB that approves the changes in point of diversion for the project, DWR will provide funds to implement multiple restoration actions necessary and sufficient to minimize effects of the project on listed salmonids. DWR will provide up to $4,000,000 annually to benefit spring-run Chinook salmon (CHNSR) and winter-run Chinook salmon (CHNWR) and steelhead in the Sacramento River watershed.

As a condition of the 2081(b) ITP, CDFW is requiring DWR to improve spawning and rearing habitat for CHNSR, CHNWR and steelhead, and contribute to establishment of additional populations of winter run, support adult spawning, egg incubation and juvenile production. The funding described above will be used specifically to establish a new population of CHNWR through introduction and reintroduction of fish into Sacramento River tributaries (which may include Battle Creek and/or upstream of Shasta Reservoir) and to support that population with associated habitat restoration and other measures within ten years of order issuance. Consistent

with the 2081(b) ITP, the goal of this action is to establish a new CHNWR population in the Sacramento River watershed within the term of this permit that meets the low extinction risk criteria identified by the Central Valley Technical Recovery Team (CVTRT) (Lindley *et al.* 2007).As a condition of the 2081(b) ITP, DWR will fully fund and implement reintroduction and restoration action effectiveness monitoring and extinction risk monitoring to ensure that the goal is met. Additionally, the 2081(b) ITP requires that funding commitments will be sufficient to support creation and enhancement of Sacramento River spawning and instream and/or off-channel rearing habitat and measurable expansion of salmonid habitat capacity. Consistent with the 2081(b) ITP, the goal of this effort is to contribute to the quantity, quality, and diversity of important rearing habitat along the Sacramento River corridor for CHNWR, CHNSR, and steelhead, and may include use of mitigation bank(s) as appropriate.

DWR and Reclamation commit to improve and expand the diversity, quantity, and quality of rearing and refuge habitat in the tidal portions of the Delta and Suisun Marsh. DWR will restore at least 1,800 acres of tidal habitat, consistent with the multi-species benefits that exist with restoration associated with the delta smelt conservation measures described below, that will contribute to improved growth, survival, and migratory success of juvenile CHNWR, CHNSR, and steelhead, including potential use of mitigation banks as deemed appropriate. This amount is in addition to the 9,000 acres of restoration currently being implemented through EcoRestore.

Additional tidal restoration, provided in part through the funding described above, will be considered if necessary to address potential undesirable hydrodynamic effects of NDD operations (*e.g.*, reverse flows) as well as climate change and sea-level rise. DWR and Reclamation commit to ongoing analytical efforts as part of the AMP to better understand what restoration (*e.g.*, location and amount), in combination with other changes to baseline would be necessary to address the effect of reverse flows caused by NDD operations. Furthermore, DWR and Reclamation commit as part of the AMP to a monitoring program to assess the performance of these actions and modify the mitigation approach as necessary to offset the effects of the project as they are better understood.

As a condition of the 2081(b) ITP, CDFW is requiring DWR to operate the SWP to achieve pre-project juvenile CHNWR and CHNSR survival rates at Chipps Island (as established by Pre-construction Study 12 in Table 6.1-5 of Section 6.1 *Description of the Proposed Action*).If alternative migratory routes and/or other CWF mitigation efforts are able to increase the number of juvenile CHNSR and CHNWR successfully passing Chipps Island or improve downstream survival rates offsetting through-Delta loss associated with NDD operations, CDFW will consider it as a potential mechanism to meet this criterion. As a condition of the 2081(b) ITP, CDFW is requiring that the Test Period and Full Project Operations survival rates shall be determined by Post-Construction Study 12 (Table 6.1-5 of Section 6.1 *Description of the Proposed Action*). CDFW is requiring that survival estimates be provided to CDFW, the Technical Oversight Team (TOT) and the North Delta Diversion Technical Team (NDDTT) on an annual basis and used in the AMP to determine if criterions are being achieved.

Delta Smelt

Restoration of 1,827.7 acres of habitat suitable for delta smelt is proposed, of which 74.7 acres is intended to minimize construction impacts from the HORG and barge landings, and 1,753 acres is intended to minimize effects from permanent loss of shallow water habitat in the vicinity and upstream of the NDD.

The proposed habitat restoration will minimize effects on delta smelt spawning, rearing, and migration habitat. Restoration will be performed at a site(s) in the vicinity of west Delta, central Delta, north Delta, Cache Slough, and/or other Service-approved site. Within these broader regions, examples of site-specific areas include, but are not limited to: Sherman Island, lower San Joaquin River (such as San Andreas Shoal and Prisoners Point area), Sutter and Steamboat Sloughs, and waterways within the Cache Slough Complex.

The 1,753 acres of compensatory mitigation from restricted upstream access will include spawning habitat, as deemed appropriate by the Service and CDFW during the site-specific design based on criteria including salinity, velocity, substrate, and locations necessary to support delta smelt spawning. The focus for spawning habitat will be on restoring or creating sandy shoals, islands, and/or channel bar augmentation. Noting that the characteristics of desirable spawning habitat for delta smelt are not well understood, these criteria will be informed by studies DWR and Reclamation will fund to monitor and research habitat preferences. DWR and Reclamation will fund monitoring and research to: (1) determine the existing use of the area at and upstream of the NDD, (2) perform studies (*e.g.*, field-based mesocosms in actual Sacramento River habitat) to determine spawning habitat characteristics, and based on this information, (3) refine existing conceptual models, in coordination with the Service and CDFW, to better define the characteristics that would be included in the site-specific restoration design to ensure that the restored sites offer high functioning spawning habitat to delta smelt.

DWR and Reclamation will develop a sediment reintroduction plan, described in concept in the CWF BA, to specifically address spawning habitat needs for delta smelt, including the potential for a recurring sediment placement program to maintain sites for the duration of the PA's long-term effects.

San Joaquin Kit Fox

DWR will compensate for loss of habitat by protecting San Joaquin kit fox habitat at a ratio of 3:1 at a location subject to Service approval, adjacent to other modeled San Joaquin kit fox habitat to provide a large, contiguous habitat block. San Joaquin kit fox habitat protection will be accomplished either through the purchase of mitigation credits through an existing, Service-approved conservation bank or will be purchased in fee-title by DWR or a DWR partner organization with approval from the Service. If purchased in fee-title, a permanent, Service-approved conservation easement will be placed on the property. Suitable San Joaquin kit fox habitat will be acquired for protection in the Byron Hills area, subject to Service approval, where there is connectivity to existing protected habitat and to other adjoining San Joaquin kit fox